

What is claimed is:

1. An absorption spectroscopy apparatus having a fluid inlet and a fluid outlet and comprising:

a sample cell including an axis, a side wall having at least one curved reflective surface arrayed about the axis and facing inwardly with respect to the cell such that a beam of energy directed against a predetermined location on the reflective surface is reflected back and forth off the reflective surface and remains in substantially the same plane while inside the cell, and at least one port in the sidewall; and

at least one source/detector reflector having a curved profile in a plane extending perpendicular to the axis of the cell, the reflector positioned with respect to the port of the cell to reflect energy through the port of the cell and against the predetermined location on the reflective surface of the side wall of the cell.

2. An absorption spectroscopy apparatus according to claim 1, wherein the reflective surface of the side wall of the cell has a circular profile in a plane extending perpendicular to the axis of the cell.

3. An absorption spectroscopy apparatus according to claim 1, wherein the reflective surface of the side wall of the cell has a flat profile in a plane extending parallel to the axis of the cell.

4. An absorption spectroscopy apparatus according to claim 1, wherein the port of the side wall of the cell comprises inlet and outlet ports, and the source/detector reflector comprises separate source and detector reflectors corresponding respectively to the inlet and the outlet ports.

5. An absorption spectroscopy apparatus according to claim 4, further comprising:

a source for directing energy against the source reflector; and

a detector for receiving energy from the detector reflector.
6. An absorption spectroscopy apparatus according to claim 1, further comprising an intermediate reflector positioned with respect to the port of the cell and the emitter/detector reflector to reflect energy from the emitter/detector reflector through the port of the cell and against the predetermined location on the reflective surface of the side wall of the cell.
7. An absorption spectroscopy apparatus according to claim 1, further comprising end walls closing ends of the side wall of the cell.
8. An absorption spectroscopy apparatus according to claim 7, wherein the end walls have reflective surfaces facing inwardly with respect to the cell.
9. An absorption spectroscopy apparatus according to claim 8, wherein the reflective surfaces of the end walls are polished.
10. An absorption spectroscopy apparatus according to claim 7, wherein the end walls are molded.
11. An absorption spectroscopy apparatus according to claim 7, wherein the end walls include the fluid inlet and the fluid outlet of the apparatus.
12. An absorption spectroscopy apparatus according to claim 1, wherein the side wall is molded.
13. An absorption spectroscopy apparatus according to claim 1, wherein the reflective surface of the side wall is polished.
14. An absorption spectroscopy apparatus according to claim 1, further comprising a light transmissive window positioned within the port of the side wall.

15. An absorption spectroscopy apparatus according to claim 1, wherein the cell has a height measured in a direction parallel to the axis substantially equal to a source length.
16. An absorption spectroscopy apparatus according to claim 1, further comprising:
a source for directing energy against the at least one source/detector reflector; and
a detector for receiving energy from the at least one source/detector reflector.
17. An absorption spectroscopy apparatus according to claim 1, wherein a energy path in the cell is substantially perpendicular to the cell axis.
18. An absorption spectroscopy apparatus according to claim 1, wherein the port of the side wall of the cell comprises a single inlet/outlet port, and the source/detector reflector comprises a single source/detector reflector, and the apparatus further comprises a source for directing energy against the source/detector reflector, and a detector for receiving energy from the source/detector reflector.
19. An absorption spectroscopy apparatus according to claim 1, further comprising a source for directing energy against the at least one source/detector reflector, wherein the source provide infrared energy.
20. An absorption spectroscopy apparatus according to claim 1, wherein the source/detector reflector comprises a segment of a cylinder.
21. An absorption spectroscopy apparatus according to claim 1, wherein the source/detector reflector is polished.
22. An absorption spectroscopy apparatus according to claim 1, wherein the source/detector reflector is molded.